Buckthorn (*Hippophaë rhamnoides* L., Elaeagnaceae), a new important food plant for the larva of *Tenthredo vespa* Retzius in Finland (Hymenoptera, Tenthredinidae)

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In Finland, the distribution of *Tenthredo vespa* Retzius corresponds well to that of the wild buckthorn (*Hippophaë rhamnoides* L.). The larvae of this sawfly were shown to feed on the leaves of the plant in an ovipositing experiment and in field studies on the phenology of larvae in buckthorn bushes. It seems that the buckthorn is the main food plant for the larva along the shore of the Gulf of Bothnia. The larva can also feed on cultivated buckthorn, as it appeared in St. Petersburg, Russia.

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1. Introduction

The buckthorn (*Hippophaë rhamnoides* ssp. *rhamnoides* L.) was one of the first plants to arrive in Fennoscandia after the Ice Age (Rousi 1980). Nowadays, it grows as a pioneering plant on the uplifted sea shores of the Gulf of Bothnia and on the Åland Islands. The berries of the buckthorn are commonly collected in autumn, and it is cultivated for its berries or as an ornamental plant in southern and central Finland. Buckthorn is also known as a food plant for some insects, e. g. three species of *Capitophorus* (Homoptera, Aphidae; Heie 1994), two species of *Cacopsylla* (Homoptera, Psyllidae; Stenroos et al. 1984, Ossiannilsson 1992), *Gelechia hippophaella* (Lepidoptera, Gelechiidae) and some other microlepidoptera, which usually feed on Rosaceae (Hering 1957), and several macrolepidoptera (Enkola 1939, Itämies 1982). The larvae of *Rhagoletis batava* Hering (Diptera, Tephritidae) feed on the berries, as described from the Netherlands (Hering 1958) and later seen in Switzerland, the Caucasus region and in 1970 in Sweden, Upl: Älvkarleby (Hedström 1995). No sawfly larvae have been known to feed on the buckthorn.

In this paper, we describe a sawfly, *Tenthredo vespa* Retzius, the larvae of which feed regularly on buckthorn leaves in western Finland.

2. Material and methods

The reports concerning *Tenthredo vespa* in the literature were reviewed as far as possible, especially with regard to Finland and its neigbouring areas and the food plants.

The Finnish sawfly collections were studied for specimens captured earlier. The following collections were searched: coll. R. Forsius, Åbo Akademi, Turku; coll. Zoological Museum, University of Turku; coll. Zoological Museum, University of Helsinki, including coll. W. Hellén; coll. Department of Applied Zoology, University of Helsinki, including coll. Th. Grönblom, J. Kangas, V. J. Karvonen and A. Saarinen; coll. Zoological Museum, University of Oulu; and the private collections of M. Viitasaari, Helsinki, and V. Vikberg, Turenki. In addition, the specimens of *T. vespa* from the Leningrad province in coll. Zoological Institute, St. Petersburg were studied.

Field studies were performed in St: Rauma and Rauman mlk., where one of the authors (JI) found the first larvae on a buckthorn bush in the 1960's. During the 1986 summer excursion of the Finnish Entomological Society to the same area, the other author (VV) collected one female *T. vespa*. In an ovipositing experiment it laid eggs, and the larvae hatched and were fed in Turenki. One larva was fed till fully grown and then dry-prepared by E. O. Peltonen.

The phenology of the larvae was studied in Om: Pyhäjoki, Yppäri, mainly in 1979 by the author JI and Ms. Katriina Koivukoski (Stenroos 1984). The area studied, the spit of Ulko-Harmi is situated on the shore of the Gulf of Bothnia about 100 km SW of Oulu. The buckthorn is common in the area and larvae were collected with a sweeping net or sometimes with a shaking umbrella from 20 different points of the buckthorn vegetation. The collecting period was between 28 May and 8 September, and larvae were collected on altogether 16 days.

The dry-prepared larva and two prepupae were studied, and Fig. 1 was drawn as described earlier (Vikberg, in print). The numbering of abdominal annulets is in accordance with Yuasa (1923), see also Vikberg & Nuorteva (1997).

The names of the plants are in accordance with Hämet-Ahti et al. 1992 and Hämet-Ahti et al. 1998.

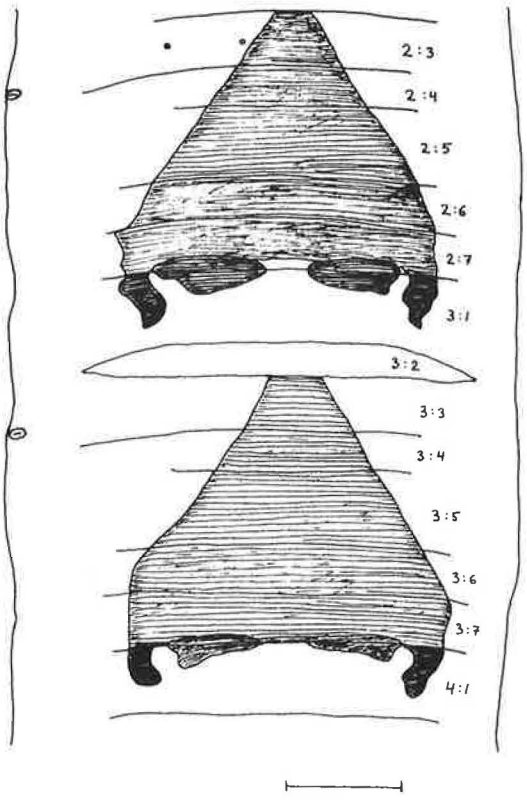

Fig. 1. Abdominal segments 2 and 3 of a fully grown larva of *Tenthredo vespa* Retzius show the spearhead-like flecks and their position on the annulets. Scale bar 1.0 mm.

3. Results

3.1. Records of *Tenthredo vespa* Retzius in the literature

Tenthredo vespa was described by Retzius (1783). The same species was described by Fabricius (1804) as *Tenthredo tricincta*, which name is a primary homonym. In the older literature the species was known as *T. tricincta* or *Allantus tricinctus*. The species has a wide distribution in the Palaearctic area from Portugal, Spain, France, Britain, Denmark and Sweden in the west to NE Turkey, Georgia, Armenia, W and E Siberia (Baikal Sea area) and China, Manchuria (Taeger 1988) in the east. From Mongolia, a subspecies, *T. vespa inaffectata* Muche, was described in 1965. Both sexes are usually reported, but males often in slightly lower numbers. In Britain, the species is distributed scantly throughout the country up to the Orkneys (Benson 1952), and adults have been captured from May till September. We have not seen any records from Norway, and in Sweden it occurs rather infrequently in from the southern parts up to Uppland, where the northernmost place of occurrence is Väddö (Malaise 1931) about 40 km W of Eckerö, Finland. According to F. Nordström, the species was frequent in 1931 on outlying rocks in the northern archipelago of Stockholm (Malaise 1931). Viitasaari et al. (1998) recorded *T. vespa* throughout 9 of 13 the phytogeographical (sub)districts of Estonia. In the Leningrad Province in Russia, the species is known to

ocur closest to Finland on Isthmus Carelicus (Nylander 1859, Forsius 1921).

The larva of *T. vespa* was first described and identified as *T. rustica* L. (a misidentification) by Degeer (1772). He found larvae in Holland on the leaves of "chevre-feuille" (*Lonicera caprifolium* L.). Later, the larva was described by Brischke (1855, 1883) and Snellen van Vollenhoven (1857), and these descriptions were cited by Dahlbom (1835), Enslin (1912) and Berland (1947). Lorenz (1957) gave the first morphological description based on chaetotaxy, etc. Verzhutskiy (1981) published his observations on the biology of the larva in E Siberia. The food plant genera mentioned by Enslin (1912), Berland (1947), Benson (1952) and Lorenz & Kraus (1957) belong to two families: *Viburnum, Lonicera, Symphoricarpos* are members of Caprifoliaceae, and *Fraxinus, Jasminum, Ligustrum* and *Syringa* belong to Oleacae. Verzhutskij (1981) found larvae only on *Spiraea media* Fr. Schmidt (Rosaceae).

From Finland, the species was captured first from the SE part in Rautus on 5-18 June, 1841 (Nylander 1859 as *T. tricincta*). This locality (Sosnovo) is now part of Russia. From present-day Finland, *T. vespa* was first recorded by Forsius (1921) in Åland and SW Finland. In 1933, he wrote that the larva seems to prefer *Viburnum* here.

3.2. Distribution and phenology of adult *Tenthredo vespa* in Finland

The Finnish sawfly collections contained 59 males and 69 females of *T. vespa,* which were reviewed for this study. Most of them (36 males, 46 females) had been collected from Åland (Al) in Eckerö, Finström, Jomala, Mariehamn, Lemland and Föglö. From regio aboensis (Ab), 3 males and 5 females were studied from Korppoo, Nystad, Uusikaupungin pitäjä (Lyökki) and Pusula. In addition, *Tenthredo vespa* L.[!] has been mentioned from Ab: Dragsfjärd, Örö (Jalas & Heikinheimo 1975). From Satakunta (St), 11 males and 12 females were studied from Rauma, Rauman mlk., Luvia and Pori (Yyteri). From Ostrobothnia australis (Oa), there were 7 males and 4 females, and all except one female from Bergö were labelled "Bothn. or, coll. Wasstj". From Ostrobothnia media (Om), two males and one female were from Kannus. Only larvae have been collected from Pyhäjoki, Yppäri.

From the area of Isthmus Carelicus, which now belongs to the Russian Leningrad Province, Finnish collections include 2 males and 7 females from Sovetskij (Johannes), Poljany (Uusikirkko) and Zelenogorsk (Terijoki).

Most Finnish specimens have been captured between 1 and 31 July. There are a few records from June: Pusula, Seppälä, female on 24.6.1946 (Y. Kangas leg.); Uudenkaupungin pit., Lyökki, male and female on 21.6.1966 (T. Ilvessalo leg.); Bergö, one female dated 17-28.6.1946 (W. Hellén leg.). There are no dates in August, but many specimens have no date but only a collecting number.

There are only a few records of the host plants of adults. In Åland, one male was captured on flowers of *Torilis japonica* (Houtt.) DC. (Apiaceae) (L. Tiensuu leg.). In Rauma, Nurmeskari, on 1.7.1986, adults visited flowers of *Angelica archangelica* ssp. *litoralis* (Fr.) Thell. (Apiaceae) and leaves of *Ribes spicatum* E. Robson (Grossulariaceae) with many aphids and licked the honey dew (V. Vikberg).

3.3. Ovipositing, rearing and description of the larva

On 1 July 1986, one female of *Tenthredo vespa* was captured on the leaves of *Ribes spicatum* in St: Rauma, Nurmes (Grid 27°E 6798:196) and taken alive to Janakkala, Turenki, where it was allowed to lay eggs on the leaves of some plants. The ovipositing experiment was carried out in a large plastic bag indoors at room temperature and out of direct sunlight. The plants were kept fresh by wrapping their basal parts in moistened kitchen paper, and the female was fed with flowers of *Aegopodium podagraria* L. and *Angelica sylvestris* L. The plants offered were *Plantago major* L., *Solidago virgaurea* L., *Syringa vulgaris* L., *Lonicera caerulea* L., *Fraxinus excelsior* L., and later *Hippophaë rhamnoides* and *Elaeagnus commutata* Bernh. ex Rydb. On 4 July the first eggs were seen on the leaves of *Solidago* and during 4-11 July the female laid 10 eggs on *Solidago*, 7

eggs on *Hippophaë* and 2 eggs on *Elaeagnus*. On 12 July the female died. The eggs were usually laid one at a time, but on the leaves of *Solidago* small groups of two and once even three eggs were also laid. While ovipositing, the female sat on the upper surface of the leaf and laid the egg through the leaf into the flesh of the lower surface, where a small swelling resulted. One observed ovipositing episode took 60 seconds. The ovipositing scar was located obliquely close to the upper leaf margin. The larvae emerged from their eggs on 11-18 July, by gnawing a small exit hole through the cuticle of the underside. The egg stage lasted for 7-8 days. The larvae did not eat *Solidago* but fed on *Fraxinus* and buckthorn. They were fed mostly buckthorn in small plastic tubes. All except two larvae died in the first instar. Only one larva was fed till fully grown, and it was killed on 17 August and dry-prepared from the freezer later. The first instar (diameter of head capsule ca. 0.7 mm) lasted for 5-6 days, the second (diameter 1.1 mm) for 5 days, the third (diameter 1.4 mm) for 5 days, the fourth (diameter 1.9 mm) for 6 days, and the fifth (diameter of head 2.55 mm) for more than 8 days. The head of the first instar is brownish black, and the body is dark grey above and pale grey underneath. The typical dorsal dark brown spearhead or arrowhead pattern is present from the third instar on. The fifth instar grew slowly from 18 mm to 22 mm long.

Description of the fully grown larva. Length of body (dry-prepared, submaximal extension) 27.5 mm, width of head 2.55 mm. The upper part of the head brownish black with bluish white powder, the lower part pale. The body has large dark brown spearhead-like dorsal flecks on the thoracic and abdominal segments 1 to 9. The sharper anterior part of the fleck is on annulet 3 of the abdominal segment and the broad posterior end on annulet 1 of the next segment (Fig. 1). The body has brownish - whitish marble patterning suprastigmally, which extends to the substigmal and surpedal lobes. The upper part of the body has pale powdering, and the lower part is pale, yellowish. The surface of the body is covered with dense velvet-like microsculpture.

Chaetotaxy. Frons 38 setae, clypeus 2 setae, labrum 3 (left side), 2 (right side) setae, mandible 2 setae, stipes 1 seta, palpifer 4-5 setae, 2. maxillar palpus 2 setae. Third abdominal segment with seven annulets, annulet 1 with several setae, annulet 3 with several setae and 2-4 glandubae (small, conical, whitish) and annulet 5 with several setae and 2-3 glandubae. Substigmal lobe with 13 setae and 2 glandubae. First poststigmal lobe with 1 seta and 1 glanduba, second with 1 glanduba and 2 setae or 2 glandubae and 1 seta. Surpedal lobe with 13 setae and 2 glandubae.

Description of prepupa based on two dry-prepared specimens. One (body 26 mm long, width of head 2.2 mm) from St: Rauma, archipelago (679:19), on buckthorn, 25.8.1979, J.Itämies & E. Eloranta leg., the other (body 32 mm long, width of head 2.58 mm) from Om (=KP): Pyhäjoki, Yppäri (715:35), in August 1984, on buckthorn, J. Itämies & K. Stenroos leg. Body shiny, setae and sculpture reduced. Head pale, brownish. Body pale, yellowish brown, spearhead flecks pale brown, smaller.

The larva has an extra moult upon change into prepupa, prepupa does not eat any more. Larvae and prepupae from Om: Pyhäjoki, Yppäri are shown in a photograph taken by the author JI in 1984 (Fig. 2). The larvae have black heads and dark dorsal flecks, the prepupae have pale bodies, pale heads and smaller paler dorsal flecks.

3.4. Phenology of larvae in Om: Pyhäjoki, Yppäri

During the summer and autumn 1986, 132 larvae and prepupae were collected from 20 different places of the buckthorn vegetation in Pyhäjoki, Yppäri. The collecting points are shown on the map (Fig. 3). The five places with the best yield (a total of 90 larvae) are situated on the shore of Ulkoharmi, where the buckthorn vegetation is densest in the area. The first larvae were found on approximately 10 July, the peak of occurrence was at the end of July, and the latest larvae or prepupae were found at the beginning of September (Fig. 4). The trials to rear adults were unsuccessful.

Fig. 2. Larvae and prepupae of *Tenthredo vespa* Retzius, the culture from the buckthorn in Pyhäjoki, Yppäri.

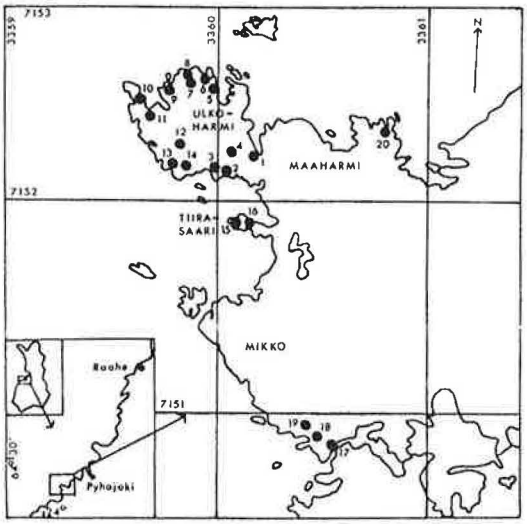

Fig. 3. The collecting points of larvae of *Tenthredo vespa* Retzius on the buckthorn in Pyhäjoki, Yppäri.

3.5. Larvae on cultivated buckthorn in St. Petersburg, Russia, and adults studied in and near to St. Petersburg

At the beginning of September 1998, two *Tenthredo* larvae were found on cultivated buckthorn in Pushkin in the southern part of St. Petersburg by Dr. A. G. Zinovjev. He took a colour picture of the larvae, which were covered by whitish powder with the typical dark brown spearhead flecks clearly visible on the dorsum, which made it easy to identify them as large larvae of *Tenthredo vespa* by the author VV.

Four females of *T. vespa* could be studied in coll. Zoological Institute, St. Petersburg. One female had been collected in "Ostrovki" on the river Neva in the Schlissenburg district on 6 June, 1906, by G. Jacobson [Yakobson]. One had been captured in Pargolovo north of St. Petersburg on 13 July, 1917, by N.S. Knyazhezkiy. Two females had been reared from larvae found on *Lonicera tatarica* L. in St. Petersburg (then Leningrad) in September 1975 by A. G. Zinovjev, and the females emerged in July 1976.

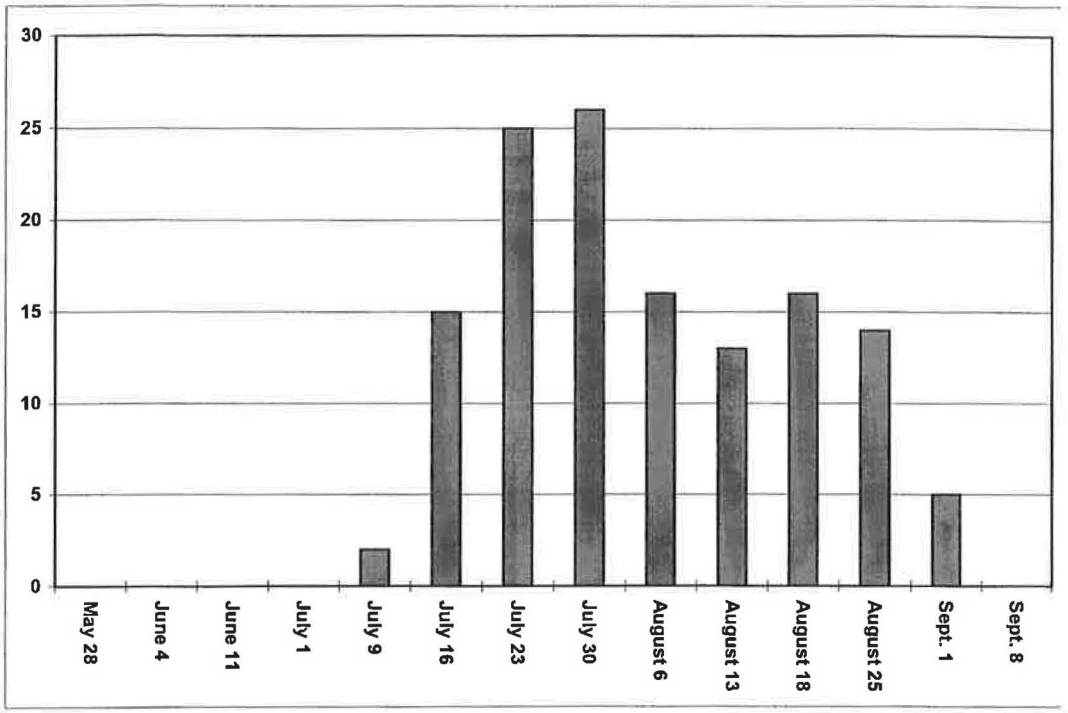

Fig. 4. The catches of larvae and prepupae of *Tenthredo vespa* Retzius on the buckthorn in Pyhäjoki, Yppäri.

4. Discussion

The known distribution of *Tenthredo vespa* in Finland and the neighbouring areas is shown on the map (Fig. 5). When compared to the distribution of the buckthorn (*Hippophaë rhamnoides*) in Finland (Hultén 1971, Rousi 1980), almost all records of *T. vespa* fit to the native area of buckthorn. There are only two records outside the native area of the buckthorn: Pusula and Dragsfjärd, Örö. The buckthorn is lacking on the coast of the Gulf of Finland, and records of *T. vespa* are similarly lacking. The findings of many larvae of *T. vespa* on buckthorn in Rauma and Pyhäjoki confirm that the buckthorn is an important food plant for the larva; it actually seems to be the main food plant in Finland.

The buckthorn grows in many places on the Swedish coast of the Gulf of Bothnia (Hultén 1971). Dr. Lars-Åke Janzon informed us about the sawfly collection in Naturhistoriska Riksmuseet, Stockholm. There are specimens of *Tenthredo vespa* from the following provinces: Skåne 6, Gotland 3, Västergötland 1, and Uppland 14 spec-

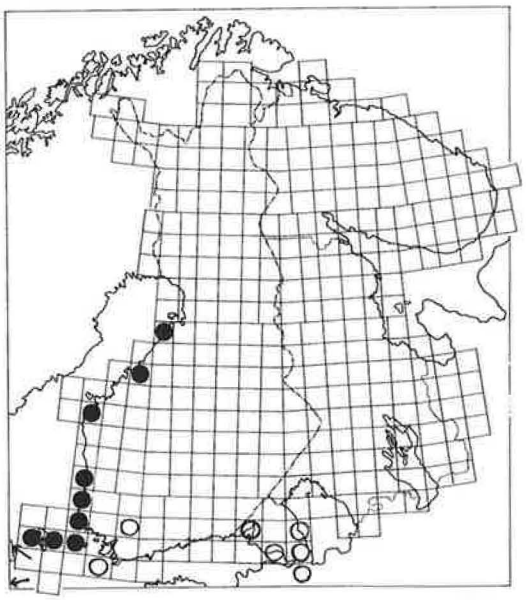

Fig. 5. Records of adults and larvae of *Tenthredo vespa* Retzius in Finland and in the Leningrad province, Russia. European UTM map. The black circles indicate the areas with native buckthorn in Finland. The arrows show the nearest places of occurrence of *T. vespa* in Sweden.

imens. The northernmost specimens are from Väddö, as reported by Malaise (1931). The lack of specimens from further up north is obviously due to a lack of collectors. Hence to ascertain the distribution of *T. vespa* along the coast of the Gulf of Bothnia, further collecting is needed especially on the Swedish coast and north of Pyhäjoki in Finland.

When our observations on the larvae are compared with those of Verzhutskiy (1981), the following differences can be noticed: only four instars were observed by Verzhutskiy, but he collected small larvae on leaves and obviously missed the first instar; the widths of their heads were as follows: 0.9-1.0; 1.2-1.4; 1.7-1.9; 2.2-2.7 mm. The food plant in E Siberia, *Spiraea media,* belongs to a different family, Rosaceae. The sawfly population may have adopted a new food plant even there. Without examining adults, it is not possible to exclude the case that it belongs to subspecies *T. vespa inaffectata*, the status of which requires further study (see Taeger 1988).

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References * not seen

Berland, L. 1947: Hyménoptères Tenthredoïdes. — Faune de France 47: 1–496.

Brischke, C. G. A. 1855: Abbildungen und Beschreibungen der Blattwespen-Larven. Berlin, 1.Lieferung — Preuss. Prov.-Bl. 1855: 318. p.15 T.3, fig. 5 a-c. *

Brischke, C. G. A. 1883: Beobachtungen über die Arten der Blatt- und Holzwespen, 2. Abtheilung. — Schr. Naturf. Ges. Danzig (N.F.) 5(4): 201–328, Taf. 1–8.

Dahlbom, G. 1835: Clavis novi Hymenopterorum systematis anatomia externa, metamorphosi moribusque horum animalium simul consideratis, adjecta synopsi larvarum ejusdem ordinis scandinavicarum eruciformium. — Lundae, I–V, 1–40, 1 colour table.

Degeer, C. 1772: Mémoires pour servir à l'histoire des Insectes. Tom. 2, Part.2. Mém. 16 et 17., p.951 n. 4 T.34 fig. 9-19. — Holmiae 1772. (Original French edition not seen, translated to German by Gösse, J. A. E. 1779: Abhandlungen zur Geschichte der Insekten. 2. Band 2. Theil. — Nürnberg.)

Enkola, K. 1939: Tyrnipensas (Hippophaes rhamnoides L.) Rauman saaristossa. Kasvimaantieteellinen tutkielma. (Der Sanddorn (Hippophaes rhamnoides L.) im Schärenbezirk von Rauma. Pflanzengeographische Untersuchung). — Silva Fennica 53: 1–26.

Enslin, E. 1912: Die Tenthredinoidea Mitteleuropas, Heft 1: 1-98. — Deutsche Entomol. Zeitschrift Beiheft. Berlin.

Fabricius, J. Ch. 1804: Systema Piezatorum. — Brunsv. 1804: 15-53. (p. 30 n. 5). *

Forsius, R. 1921: Zur Kenntnis einiger Blattwespen und Blattwespenlarven 2. — Medd. Soc. F. Fl. Fenn. 46: 25–32.

Forsius, R. 1933: Weitere Beiträge zur Kenntnis der Tenthredinoiden Finnlands. — Notulae Entomol. 13: 4–10.

Hedström, L. 1995: Svenska insektfynd — rapport 8. (Swedish insect records — rapport 8). — Entomol. Tidskr. 116(3): 101–117. (In Swedish, with an English abstract)

Heie, O. E. 1994: The Aphidoidea (Hemiptera) of Fennoscandia and Denmark. V. Family Aphididae: Part 2 of tribe Macrosiphini of subfamily Aphidinae. — Fauna Entomol. Scandinavica 28: 1–239.

Hering, E. M. 1957: Bestimmungstabellen der Blattminen von Europa einschliesslich des Mittelmeerbeckens und der Kanarischen Inseln 1. — W. Junk, 'S-Gravenhage. 648 pp.

Hering, E. M. 1958: Zwei neue paläarktische Rhagoletis (Dipt., Trypet.). — Stuttg. Beitr. Naturk. 7: 1–4.

Hultén, E. 1971: Atlas över växternas utbredning i Norden, fanerogamer och ormbunksväxter (Atlas of the distribution of vascular plants in northwestern Europe). 2. edition. — Kartografiska Institut, Stockholm. 1*–56*, 1–531. (In Swedish, with an English summary and glossary).

Hämet-Ahti, L., Palmén, A., Alanko, P. & Tigerstedt, P.M.A. 1992: Suomen puu- ja pensaskasvio (Woody Flora of Finland). 2. Fully revised edition. – Yliopistopaino, Helsinki. 373 pp. (In Finnish, with English summary)

Hämet-Ahti, L., Suominen, J., Ulvinen, T. & Uotila, P. (eds.) 1998: Retkeilykasvio. 4. edition. — Yliopistopaino, Helsinki. 656 pp. (In Finnish, with an English summary).

Itämies, J. 1982: The Lepidoptera succession on the islands of Rauma, SW Finland. — Aquilo Ser Zool. 21: 13–52.

Jalas, I. & Heikinheimo, O. 1975: Suomen Hyönteistieteellisen Seuran kesäretkiä. Retki Örön saareen 1971. — Ann. Entomol. Fennici 41: 44. (In Finnish)

Lorenz, H. 1957: Unterfamilie Tenthredininae. In: Lorenz, H. & Kraus, M. 1957: Die Larvalsystematik der Blattwespen (Tenthredinoidea und Megalodontoidea): 51–84. — Akademie-Verlag, Berlin.

Lorenz, H. & Kraus, M. 1957: Die Larvalsystematik der Blattwespen (Tenthredinoidea und Megalodontoidea). – Abhandlungen zur Larvalsystematik der Insekten 1: i–vii, 1–339. Akademie-Verlag, Berlin.

Malaise, R. 1931: Steklar, Hymenoptera. 4. Växtsteklar, Phytophaga. — Svensk insektfauna 13: 1–48. Stockholm. (In Swedish)

Nylander, W. 1859: [Hymenoptera och Diptera insamlade af G. Appelberg och W. Pipping i Ladoga-trakterna under sommaren 1841]. — Bidrag till Finlands Naturkännedom, etnografi och statistik 3: 109–118. (In Swedish)

Ossiannilsson, F. 1992: The Psylloidea (Homoptera) of Fennoscandia and Denmark. — Fauna Entomol. Scandinavica 26: 1–346.

Retzius, A. J. 1783: Caroli de Geer genera et species Insectorum. Lipsiae. [Tenthredo vespa p. 72 n. 302] *

Rousi, A. 1980: Hippophaë L. - Tyrnin suku. In: Jalas, J. (ed.): Suuri kasvikirja 3: 139–144. — Otava, Keuruu. (In Finnish).

Snellen van Vollenhoven, S. C. 1857: De inlandsche Bladwespen in hare gedaante verwisselingen en levenswijze beschreven. — Tijdschrift voor Entomologie 1: 171–176, pl. 9. (seen as a separate with different page numbering)

Stenroos, K. 1984: Kasvi-kasvinsyöjä- ja peto-saalissuhteesta tyrnillä. — Mimeogr. University of Oulu, 65 pp.

Stenroos, K., Itämies, J. & Kyrki, J. 1984: Psylla hippophaes ja P. zetterstedti (Psyllidae) Pyhäjoelta (KP). — Notulae Entomol. 64: 197. (In Finnish, with an English summary)

Taeger, A. 1988: Zweiter Beitrag zur Systematik der Blattwespengattung Tenthredo (s. str.). (Hymenoptera, Symphyta, Tenthredininae). — Beitr. Ent., Berlin 38 (1): 103–153.

Verzhutskiy, B. N. 1981: (Phytophagous insects in ecosystems of the Eastern Siberia (sawflies and horntails). — Nauka Novosibirsk, 1981. 302 pp.

Viitasaari, M., Heidemaa, M., Nuorteva, M., & Zinovjev, A. 1998: An annotated checklist of the sawflies (Hymenoptera, Symphyta) of Estonia. — Proc. Estonian Acad. Sci. Biol. Ecol., 47(2): 126–147.

Vikberg, V. 1999: Lathroplex anthreni sp. n. (Hymenoptera, Ichneumonidae), a parasitoid on Anthrenus museorum (Linnaeus) in southern Finland. — Entomol. Fennica 10: 239–244.

Vikberg,V. & Nuorteva, M. 1997: On the rearing of Nesoselandria morio (Fabricius) and Birka cinereipes (Klug) (Hymenoptera, Tenthredinidae), with descriptions of their larvae. — Entomol. Fennica 8: 27–38.

Yuasa, H. 1923 (1922): A classification of the larvae of the Tenthredinoidea. — Ill. Biol. Monogr. 7(4): 1–172.